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Responses to EPA Technical Comments on the *Draft Baseline Ecological Risk Assessment, Blows Creek, St. Juliens Creek Annex, Chesapeake, Virginia* (CH2M HILL, February 2006)

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EPA Technical Comments

1. **Comment:** The baseline ecological risk assessment for Blows Creek included performing benthic toxicity tests to evaluate impacts to benthic invertebrates and characterizing mercury concentrations in fish to evaluate risk to piscivorous birds. Significant benthic impacts were found at two locations, one (SD36) of which has been addressed via source control remedial activities at Site 4. The other location (SD11) does not have a strong correlation with co-located contaminants in sediment. Further investigation may be required in this area, perhaps associated with investigations for AOC 1 and AOC 8.

   Response: Chemical concentrations detected in sediments from SD11 are lower than those in sediments from many other sample locations, where no adverse bioassay organism response was observed. The low chemical concentrations detected in sediment at SD11, coupled with the low chemical concentrations detected around AOC 1 and AOC 8 strongly suggest that the isolated bioassay organism response is either a laboratory artifact or the result of a confounding factor not associated with a Navy ER release and that no further evaluation of this area is warranted.

2. **Comment:** In Section 3.3, the Ingestion Screening Values for Belted Kingfisher table shows data for the mallard. It is not clear why mallard data is being used for the belted kingfisher. The Wildlife Factors Handbook indicates a breeding adult belted kingfisher has a mean weight ranging from 136 to 158 grams. This is significantly different than the mallard's weight of 1 kg. This will likely change the calculated LOAEL, MATC, and NOAEL values also.

   Response: While the mallard's body weight is higher than that of the belted kingfisher, the chronic toxicity values for mallard are lower than those found in the scientific literature for other avian species. This includes avian species with lower body weights. For example, the NOAEL and LOAEL reported in Sample et al. (1996) for reproduction in Japanese quail (body weight of 0.15 kg) is 0.90 mg/kg/d and 0.45 mg/kg/d, respectively. Meanwhile the NOAEL and LOAEL used in the BERA are 0.078 mg/kg/d and 0.026 mg/kg/d, respectively. Because the belted kingfisher body weight (0.15 kg, reported by Dunning 1993) was used to estimate ingestion, the use of the lower toxicity value for mallard results in a more conservative estimate of potential risk. The HQs with the mallard chronic toxicity values were determined in the BERA to be 0.68 for the

NOAEL and 0.23 for the LOAEL. Meanwhile, the HQs determined with the less conservative Japanese quail chronic toxicity values are 0.45 for the NOAEL and 0.90 for the LOAEL.

3. **Comment:** Mercury concentrations in Blows Creek sediment remains elevated as a result of historical activity at the site. Although mercury was not found at concentrations of major concern in mummichogs, the characterization of bioaccumulation in the Creek has considerable uncertainty with the limited data that has been collected. Remedial activities at source locations have been performed and are on-going. In particular, BTAG recognizes that remedial activities (waste and soil removal) planned for Site 5 will address a significant source area to Blows Creek and will facilitate the natural attenuation of contaminants in the Creek, particularly if wetland areas are restored at the site as has been discussed in Site 5 remedial scoping meetings.

   Response: The Navy concurs. The risk evaluation objectives for performing the whole body fish analysis as part of this risk assessment have been met and based on the results, no further investigation is warranted. Removal and remedial action activities conducted to-date of potential upland sources (Site 3 waste, soil, and drainage removal; Site 4 soil cover and eastern drainage removal; Site 6 soil removal; and Site 19 soil removal) greatly reduces the potential for chemical transport to Blows Creek. Site 5 is currently under the RI stage and an EE/CA is being prepared to address the waste/burnt soil area.

4. **Comment:** In Section 4.1, Risk Outcomes for Benthic Dwelling Organisms, there is a reference to the Sediment Bioassay Outcomes Figure. A review of this figure leads to a concern about the raw data for both the lab control, reference, and the pooled reference (if different than the reference). For example, for male mean growth there are eight Blows Creek samples that showed a significant effect when compared to the pooled reference data. However, this information is not shown on the figure, as only two sample locations are listed as being significantly reduced when compared to pooled reference or both lab control and pooled reference. Further explanation of the data presented in this figure/table is needed.

   Response: Data in the table is correct as presented. A limited number of color dots in the figure will be revised to correctly present the bioassay outcomes. This change does not alter the outcome or conclusions of the risk assessment.

5. **Comment:** In Section 4.1, there is a reference to an EqP Comparison Figure. The figures relating to some of the chemicals do not appear correct. For example, Aroclor-1260 is listed with a range of hazard quotients from 179 to 1,337. However, the figure showing these Aroclor-1260 HQs only has the color for ND (assumed to be non-detect) and needs to have the color for HQ > 25 for all sample points. The other figures also need to be rechecked for accuracy.

   Response: Data in the table is correct as presented. A limited number of color dots in the figure will be revised to correctly present the EqP outcomes. This change does not alter the outcome or conclusions of the risk assessment.

6. **Comment:** Section 5.1 refers to a Correlations Coefficient Outcome Table. This table contains three columns with the headings > 0.8, 0.5-0.79, and < or = 0.49. Definitions of these column headings and any associated uncertainties need to be provided as

footnotes. In addition, any uncertainties associated with the use of correlation coefficients need to be detailed in Section 7 of this report.

Response: A footnote will be added to clarify that the column headings summarize the outcomes of multiple correlations that were run to compare the concentrations of each analyzed chemical to each reported bioassay organism response. The footnote will clarify that the proportions presented in the table represent the total number of correlation coefficients falling within each range over the total number of correlations run. A summary of the key uncertainties associated with the correlations will be added to the Uncertainty section of the BERA.

References

Dunning, J.B., Jr. (editor). 1993. *CRC handbook of avian body masses.* CRC Press, Boca Raton, FL. 371 pp.

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. *Toxicological benchmarks for wildlife: 1996 revision.* Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-86/R3.